IN THE UNITED STATES PATENT AND TRADEMARKS OFFICE

In The Matter of Patent Application:

First Named Inventor	:	Hamid Ould-Brahim
Serial No.	:	10/657,939
Filing Date	:	September 9, 2003
Title	:	SVC-L2.5 VPNs: COMBINING LAYER-3 VPNs TECHNOLOGY WITH SWITCHED MPLS/IP L2VPNs FOR ETHERNET, ATM AND FRAME RELAY CIRCUITS
Examiner	:	HOANG, HIEU T
Art Unit	:	2152
Confirmation No.	:	1612

To: Mail Stop Appeal Brief-Patents
Commissioner for Patents
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APPELLANT'S BRIEF ON APPEAL

Dear Sir:

This Appeal Brief is submitted further to the Notice of Appeal From The Examiner To The Board Of Patent Appeals And Interferences filed April 1, 2008. The Applicant respectfully submits that this Appeal Brief complies with all requirements of 37 C.F.R. 41.37.

The fee for filing this Appeal Brief is submitted herewith. In the Applicant's respectful submission, no other fees are due in connection with the filing of this Appeal Brief. If the Applicant is mistaken, the Commissioner is hereby authorized to deduct any

fees required, and, in particular, any extension of time fees, from deposit account no. 13-2400.

TABLE OF CONTENTS

(i) *Real party in interest*

The real party in interest is Nortel Networks Limited, 2351 Boulevard Alfred-Nobel, St. Laurent, Quebec, H4S 2A9, Canada. Nortel Networks Limited is the Assignee of the entire right, title and interest in the subject application, by virtue of an Assignment recorded on 09/09/2003 on Reel 014487 at Frame 0282.

(ii) *Related appeals and interferences*

Appellant, the undersigned Agent, and Assignee are not aware of any related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(iii) *Status of claims*

Claims 1-24 remain pending in the application. Claims 1-12, 16, 18, 22 and 23 were amended in the course of prosecution and claims 13-15, 17 and 19-21 stand as originally filed. Each of claims 1-24 has been rejected. A copy of the pending claims as they currently stand finally rejected is attached as the Claims Appendix.

(iv) *Status of amendments*

No amendments have been filed or entered subsequent to the final Office Action of October 2, 2007.

(v) *Summary of claimed subject matter*

Claim 1 is an independent claim to a network for providing switched virtual circuit Layer-2.5 VPNs. The network includes a set of elements interconnected by services, at least one first subset of the elements defining a private network (405, VPN A). The network also includes at least one second subset of elements different from the first subset defining a provider network (401) wherein at least two subgroups of the first subset of elements may be connected via the provider network (see FIG. 4), the second subset of elements implementing a Layer-3 VPN service. The network further includes a provisioning mechanism (309) used to define element membership in the first subset of elements, a plurality of customer ports maintained on the elements of the first subset of elements and a plurality of provider ports maintained on the second set of elements, each of the plurality of provider ports connected by services (409, see paragraph [0145]) to a customer port, where the services allow the elements of the first subset of elements to establish Layer-3 peering with the second set of elements (see paragraph [0151]) to exchange routing information. Additionally, the network includes a port information table (see paragraph [0137]) at each element of the provider network having a provider port among the plurality of provider ports, the port information table containing mapping information (see paragraph [0137]) relating addresses of the customer ports to addresses of the provider ports for the first subset of elements. Furthermore, the network includes a signalling mechanism (502, see paragraph [0152]) used to create Layer-2 connectivity between elements within the first subset of

elements at the Layer-2 level across the Layer-3 VPN service implemented by the second subset of elements and a reachability distribution mechanism (503, see paragraph [0152]) such that a layer-2 VPN may be provided across the Layer-3 VPN service.

Claim 12 is an independent claim to a method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of the elements defines a private network (405, VPN A) and at least one second subset of elements different from the first subset defines a provider network (401) implementing a Layer-3 VPN service and wherein at least two subgroups of the first subset of elements may be connected via the provider network. The method includes defining element membership (see paragraph [0130]) in the first subset of elements via a provisioning mechanism (309), establishing a plurality of customer ports within the elements of the first subset of elements and establishing a plurality of provider ports within the second set of elements (see paragraph [0137]), each of the plurality of provider ports connected by services (409, see paragraph [0145]) to a customer port, where the services allow the elements of the first subset of elements to establish Layer-3 peering (see paragraph [0151]) with the second set of elements to exchange routing information. The method also includes establishing a port information table (see paragraph [0137]) at each element of the provider network having a provider port among the plurality of provider ports, the port information table containing mapping information relating addresses of the customer ports to addresses of the provider ports.

The method further includes determining reachability (505, see paragraph [0152]) across the second subset of elements and creating Layer-2 connectivity (see paragraph [0139]) within the first subset of elements at the Layer-2 level across the Layer-3 VPN service implemented by the second subset of elements via a signalling mechanism (502) thereby allowing provision of a Layer-2 VPN across the Layer-3 VPN service while allowing provision of Layer-3 services.

Claim 23 is an independent claim to a method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of the elements defines a private network (405, VPN A) and at least one second subset of elements different from the first subset defines a provider network (401) and wherein at least two subgroups of the first subset of elements may be connected via the provider network. The method includes defining a L2VPN topology (see paragraph [0130]), establishing a plurality of customer ports within the elements of the first subset of elements and establishing a plurality of provider ports within the second set of elements (see paragraph [0137]), each of the plurality of provider ports connected by data and signalling services (409, see paragraph [0145]) to a customer port, where the data and signalling services allow the elements of the first subset of elements to establish Layer-3 peering (see paragraph [0151]) with the second set of elements to exchange routing information. The method also includes creating a Layer-2 Port Information Table (see paragraph [0137]) for each provider port, establishing the identity of the customer ports attached to each provider port among the plurality of provider ports, and populating the

Layer-2 Port Information Table at the each provider port with mapping information relating addresses of the customer ports to addresses of the provider ports. The method further includes distributing the mapping information (see paragraph [0138]) to Layer-2 Port Information Tables of the provider network via an auto-discovery mechanism, determining reachability (505, see paragraph [0152]) across the second subset of elements via a Layer-3 VPN service and creating Layer-2 connectivity (see paragraph [0139]) within the first subset of elements at the Layer-2 level across the Layer-3 VPN service implemented by the second subset of elements via a signalling mechanism (502) upon request from an element within the first subset of elements, thereby allowing provision of a Layer-2 VPN across the Layer-3 VPN service while allowing provision of Layer-3 services.

Claim 24 is an independent claim to a network for providing switched virtual circuit Layer-2.5 VPNs. The network includes a plurality of customer edge devices (405) associated in a Layer-2 Virtual Private Network (VPN A) and a plurality of provider edge devices (403) associated in a Layer-3 Virtual Private Network (401). Each provider edge device of said plurality of provider edge devices is configured to receive Layer-3 routing instructions from an attached customer edge device of said plurality of customer edge devices (see paragraphs [0115]-[0124]), receive Layer-2 data frames from said attached customer edge device and route said Layer-2 data frames through said Layer-3 Virtual Private Network according to said Layer-3 routing instructions (411, FIG. 4, see paragraph [0045]).

(vi) *Grounds of rejection to be reviewed on appeal*

Issues

The following issues are on appeal:

Whether claims 1-23 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Ould-Brahim et al., "BGP/GMPLS Optical VPNs" (hereinafter "Ould-Brahim") in view of Rosen et al., "BGP/MPLS VPNs" (hereinafter "Rosen"). Claims 1-23 are on appeal.

Whether claim 24 is properly rejected under 35 U.S.C. § 102(b) as being anticipated by Ould-Brahim et al., "BGP/GMPLS Optical VPNs" (hereinafter "Ould-Brahim"). Claim 24 is on appeal.

(vii) *Argument*

Overview of Claimed Invention

The claimed invention relates to allowing provision of a Layer-2 Virtual Private Network (VPN) across a Layer-3 VPN service. In particular, where portions of a Layer-2 VPN (VPN A) are geographically distributed and yet all have access to a provider network (401), the claimed invention allows the Layer-3 VPN service to provide services normally associated with Layer-2 VPNs while also offering services normally associated with Layer-3 VPNs. This mix of Layer-2 VPN services and Layer-3 VPN services gives rise to the use of the term Layer-2.5 in the title of the application. One

aspect of the claimed invention that allows the Layer-3 VPN service to provide services normally associated with Layer-2 VPNs is the establishment of Layer-3 peering between customer ports and provider ports, which peering allows for the exchange of routing information and instructions between the edge devices in the customer (Layer-2) networks and edge devices in the provider (Layer-3) network.

Overview of Primary Cited Art

Ould-Brahim discloses a set of mechanisms that, for a service provider network that offers Optical Virtual Private Network (OVPN) service, provides an ability to support what is known as "single end provisioning", where addition of a new port to a given OVPN would involve configuration/provisioning changes only on the devices connected to that port. Ould-Brahim also discloses a set of mechanisms that provide an ability to establish/terminate an optical connection between a pair of (existing) ports within an OVPN without involving configuration/provisioning changes in any of the provider devices.

Rosen describes a method by which a Service Provider with an IP backbone may provide Virtual Private Networks (VPNs) for its customers. Multiprotocol Label Switching (MPLS) is used for forwarding packets over the backbone, and Border Gateway Protocol (BGP) is used for distributing routes over the backbone. The primary goal of the method described by Rosen is to support the outsourcing of IP backbone services for enterprise networks. The method described by Rosen does so in a manner

which is simple for the enterprise, while still scalable and flexible for the Service Provider, and while allowing the Service Provider to add value.

Argument Regarding Rejections

The Examiner has rejected claims 1-23 under 35 U.S.C. § 103(a) as being obvious having regard to Ould-Brahim in view of Rosen.

The Final Office Action was issued following the United States Supreme Court's decision in the case of KSR Int'l Co. v. Teleflex Inc., No. 04-1350 (April 30, 2007). In light of the KSR decision, Applicant wishes to address various issues pertaining to a proper analysis under section 103.

The Examiner, by citing two references and asserting a reason for combining elements from the two references, has elected to base the rejection of claims 1-23 upon a teaching, suggestion or motivation to select and combine features from the cited references. Applicant wishes to point out that the Supreme Court's KSR decision did not reject use of a "teaching, suggestion or motivation" analysis as part of an obviousness analysis, characterizing the analysis as "a helpful insight." KSR slip op. at 14-15.

When the Examiner chooses to base a rejection upon a teaching, suggestion or motivation analysis, the Examiner must satisfy the requirements of such an analysis. In particular, the Examiner must demonstrate with evidence and reasoned

argument that there was a teaching, suggestion or motivation to select and combine features from the cited references, e.g., In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). Moreover, the prior art must suggest the desirability of the combination, not merely the feasibility, see In re Fulton, 73 USPQ2d 1141, 1145 (Fed. Cir. 2004).

In the event that the cited references fail to disclose or suggest all of the elements recited in the claims, then combining elements from the references would not yield the claimed subject matter, regardless of the extent of any teaching, suggestion or motivation.

Although the Supreme Court did not reject use of a "teaching, suggestion or motivation" analysis, the Supreme Court did say that it was not the only possible analysis of an obviousness question. Because of the Examiner's chosen ground for rejection, however, the only pending ground for rejection must be a "teaching, suggestion or motivation" analysis. In the event that the Examiner chooses to consider a different avenue for rejection, this would be a new ground for rejection not due to any action by Applicant. Applicant has a right to be heard on any new ground for rejection.

Applicant further respectfully reminds the Examiner that, even after KSR, the following legal principles are still valid, having been endorsed by the Supreme Court or having been unaffected by its decision: (1) the USPTO still has the burden of proof on the issue of obviousness; (2) the USPTO must base its decision upon evidence, and it must support its decision with articulated reasoning (slip op. at 14); (3) merely

demonstrating that all elements of the claimed invention exist in the prior art is not sufficient to support a determination of obviousness (slip op. at 14-15); (4) hindsight has no place in an obviousness analysis (slip op. at 17); and (5) Applicant is entitled to a careful, thorough, professional examination of the claims (slip op. at 7, 23, in which the Supreme Court remarked that a poor examination reflected poorly upon the USPTO).

Claim 1

It appears that the Examiner's rationale for the rejection of claim 1 is that claim 1 combines prior art elements according to known methods to yield predictable results. The Applicant respectfully submits that the references cited by the Examiner fail to disclose or suggest all of the elements recited in claim 1.

Claim 1 requires that the services connecting customer ports to provider ports "allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information". Such Layer-3 peering between customer elements and provider elements and Layer-2 connectivity creation beneficially facilitates the provision of a Layer-2 VPN across a Layer-3 service.

The Examiner has indicated considering that a passage that starts at page 6 last paragraph and extends to page 7 paragraph 5 of Ould-Brahim discloses that a CE may pass, by using BGP, customer port information to the PE. Furthermore, the Examiner indicates that the passage also discloses that the PE passes the information stored in the PE port information tables to the attached CEs using BGP.

Applicant submits that the Examiner has mischaracterized the exchange of port information as the establishment of Layer-3 peering as required by claim 1.

Applicant submits that a person of ordinary skill in the art would understand that Layer-3 peering refers, for example, to interconnection of two edge devices for the purposes of exchanging packets which are destined for one (or both) of the networks to which the edge devices belong. Layer 3 peering is generally agnostic to the packet payload, and is frequently achieved using a routing protocol such as BGP to exchange the required routing information.

The Examiner indicates, in paragraph 7, that Ould-Brahim alone discloses "Layer-2 connectivity between elements within said first subset of elements at the Layer-2 level across said Layer-3 VPN service".

In response, the Applicant reminds the Examiner that Ould-Brahim relates to the establishment of *Optical* VPNs. Optical VPNs are inherently Layer-1 VPNs. Recall that the network layer (Layer-3) is responsible for end to end (source to destination) packet delivery, whereas the data link layer (Layer-2) is responsible for node to node (hop to hop) packet delivery.

Despite the assumption, in Ould-Brahim, that CE-to-CE optical connectivity is based on Generalized Multiprotocol Label Switching (GMPLS), Applicant submits that the CEs are not members of a Layer-2 VPN but, instead, are members of a Layer-1 VPN. In Ould-Brahim, the CE are using GMPLS to create layer-1/optical

connections only. Accordingly, Ould-Brahim indicates (page 4, paragraph 4) that there is a need for control channel. Notably, the control channel is necessary due to fact that layer-2 signalling packets may not be exchanged between layer-1-based ports (CE and PE ports).

The last paragraph of page 3 of Ould-Brahim indicates that:

"A CE is connected to a PE ONE via one or more links, where each link may consists of one or more channels or sub-channels (e.g., wavelength or wavelength and timeslot respectively)."

Furthermore, page 4, paragraph 5 of Ould-Brahim indicates that:

"A link has two end-points - one on CE and one on PE ONE. In the context of this document we'll refer to the former as "CE port", and to the latter as "PE ONE port". From the above it follows that a CE is connected to a PE ONE via one or more ports, where each port may consists of one or more channels or sub-channels (e.g., wavelength or wavelength and timeslot respectively), and all the channels within a given port have shared similar characteristics (e.g., bandwidth, encoding, etc.), and can be interchanged from the CEs point of view. Channels on different ports of a CE need not have the same characteristics."

It is noteworthy that the types of ports mentioned in Ould-Brahim are all Layer-1/Optical based ports.

Despite the propagation, in Ould-Brahim, of local information from one PE ONE to another PE ONE by using BGP with multi-protocol extensions, Applicant submits that the PEs do not implement a Layer-3 VPN service, as required by claim 1.

Applicant submits that the Optical VPN disclosed in Ould-Brahim may be distinguished from the Layer-3 VPN service, as claimed, in that a layer-3 VPN service requires IP traffic between the CE and PE, while the disclosed Optical VPN has only optical interfaces between the CE and the PE ONE.

Applicant submits that neither Ould-Brahim nor Rosen disclose Layer-3 peering between customer elements and provider elements. Since neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen disclose the Layer-3 peering between customer elements and provider elements, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 1.

Claim 2

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 1. Claim 2 is dependent upon claim 1 and claim 2 adds a limitation to claim 1, where the limitation specifies that the reachability distribution mechanism uses a Layer-3 VPN service.

The Examiner indicates that Rosen discloses a reachability distribution mechanism using a Layer-3 VPN service. In particular, the Examiner points to the discussion of VPN-IPv4 in section 4.2.2 at paragraph 1. The Applicant submits that VPN-IPv4 is not used as a reachability distribution mechanism. Indeed, it is "VPN-IPv4 routes" that are being distributed and an IBGP connection that is used as the reachability distribution mechanism. Accordingly, claim 2 stands or falls with claim 1.

Based on dependence upon claim 1, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 2, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 2.

Claim 3

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 2. Claim 3 is dependent upon claim 2 and claim 3 adds a limitation to claim 2, where the limitation specifies that a subset of Layer-3 VPN service piggybacks VPN routes onto the backbone Border Gateway Protocol.

The Examiner indicates that Rosen discloses piggybacking VPN routes onto the backbone Border Gateway Protocol. While Rosen doesn't use the terms "piggybacking" and "backbone", the Applicant submits that claim 3 stands or falls with claims 1 and 2.

Based on indirect dependence upon claim 1, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 3, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 3.

Claim 4

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 2. Claim 4 is dependent upon claim 2 and claim 4 adds a limitation to claim 2, where the limitation specifies that a subset of Layer-3 VPN service uses a virtual router redistribution scheme.

The Examiner indicates that Rosen discloses use of a virtual router redistribution scheme. While Rosen doesn't use the term "virtual router", the Applicant submits that claim 4 stands or falls with claims 1 and 2.

Based on indirect dependence upon claim 1, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 4, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 4.

Claim 5

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a

combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 1. Claim 5 is dependent upon claim 1 and claim 5 adds a limitation to claim 1, where the limitation specifies that the signalling mechanism is an MPLS signalling mechanism.

The Examiner indicates that Ould-Brahim discloses an MPLS signalling mechanism. Indeed, Ould-Brahim discloses using a GMPLS signalling mechanism to establish optical connections between client devices. As stated above, the Applicant submits that, in Ould-Brahim, the CE are using GMPLS to create layer-1/optical connections only. Accordingly, Ould-Brahim does not disclose use of MPLS in the manner in which the signalling mechanism is described in claim 1. Applicant submits that claim 5 stands or falls with claim 1.

Based on direct dependence upon claim 1, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 5, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 5.

Claim 6

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 1. Claim 6 is dependent upon claim 1 and claim 6 adds a limitation to claim 1, where the limitation specifies that the network of claim 1 includes an auto-discovery mechanism "for distributing said mapping information to port information tables of said

provider network".

The Examiner indicates that Ould-Brahim discloses an auto-discovery mechanism "for distributing said mapping information to port information tables of said provider network" and, in support, cites propagation of local information to other PE ONEs by using BGP with multi-protocol extensions. While Rosen doesn't use the term "mapping information", the Applicant submits that claim 6 stands or falls with claim 1.

Based on direct dependence upon claim 1, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 6, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 6.

Claim 7

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 6. Claim 7 is dependent upon claim 6 and claim 7 adds a limitation to claim 6, where the limitation specifies that the auto-discovery mechanism uses Border Gateway Protocol.

The Examiner indicates that Ould-Brahim discloses an auto-discovery mechanism "for distributing said mapping information to port information tables of said provider network" and, in support, cites propagation of local information to other PE

ONEs by using BGP with multi-protocol extensions. Accordingly, the Applicant submits that claim 7 stands or falls with claim 6.

Based on indirect dependence upon claim 1, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose all of the elements of claim 7, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 7.

Claim 8

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 1. Claim 8 is dependent upon claim 1 and claim 8 adds a limitation to claim 1, where the limitation specifies that the provisioning mechanism "operates in conjunction with said signalling mechanism to restrict element connectivity to elements of said first subset".

The Examiner indicates that Ould-Brahim discloses the restriction claimed in claim 8, that is, a restriction of connectivity. However, the passage of Ould-Brahim cited by the Examiner relates to restriction of addition of routes to a port information table (PIT). The Applicant submits that the restriction of addition of routes to a PIT is distinct from operating in conjunction with a signalling mechanism to restrict element connectivity. Accordingly, the Applicant submits that claim 8 stands or falls alone.

Since neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 8, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 8.

Claim 9

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 1. Claim 9 is dependent upon claim 1 and claim 9 adds a limitation to claim 1, where the limitation specifies that the data and signalling services of claim 1 have IP signalling services.

The Examiner indicates that Rosen discloses IP signalling services. Accordingly, the Applicant submits that claim 9 stands or falls with claim 1.

Based on direct dependence upon claim 1, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose all of the elements of claim 9, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 9.

Claim 10

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim

1. Claim 10 is dependent upon claim 1 and claim 10 adds a limitation to claim 1, where the limitation specifies that the customer port addresses need be unique only within said first subset of elements.

The Examiner indicates that Ould-Brahim discloses that a PE ONE identifier need not be unique across several OVPNs. Accordingly, the Applicant submits that claim 10 stands or falls with claim 1.

Based on direct dependence upon claim 1, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose all of the elements of claim 10, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 10.

Claim 11

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 1. Claim 11 is dependent upon claim 1 and claim 11 adds a limitation to claim 1, where the limitation specifies that the customer port addresses and provider port addresses use an addressing scheme chosen from the group of IPv4, IPv6, and NSAP.

The Examiner indicates that Ould-Brahim discloses that a an IP address may be chosen as a port identifier. Accordingly, the Applicant submits that claim 11 stands or falls with claim 1.

Based on direct dependence upon claim 1, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose all of the elements of claim 11, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 11.

Claim 12

It appears that the Examiner's rationale for the rejection of claim 12 is that claim 12 combines prior art elements according to known methods to yield predictable results. The Applicant respectfully submits that the references cited by the Examiner fail to disclose or suggest all of the elements recited in claim 12.

Claim 12 describes a method of organizing a network. The method includes an element that requires that services connecting customer ports to provider ports "allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information".

In conjunction with the discussion of the rejection of claim 1 above, the Applicant has submitted that neither Ould-Brahim nor Rosen disclose Layer-3 peering between customer elements and provider elements. Since neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen disclose the Layer-3 peering between customer elements and provider elements, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 12.

Claim 13

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 12. Claim 13 is dependent upon claim 12 and claim 13 adds a further limitation to claim 12, the further limitation being that reachability is determined via a Layer-3 VPN service.

The Examiner indicates that Rosen discloses a reachability distribution mechanism using a Layer-3 VPN service. In particular, the Examiner points to the discussion of VPN-IPv4 in section 4.2.2 at paragraph 1. The Applicant submits that VPN-IPv4 is not used as a reachability distribution mechanism. Indeed, it is "VPN-IPv4 routes" that are being distributed and an IBGP connection that is used as the reachability distribution mechanism. Be that as it may, the Applicant submits that claim 13 stands or falls with claim 12.

Based on dependence upon claim 12, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 13, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 13.

Claim 14

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 13. Claim 14 is dependent upon claim 13 and claim 14 adds a limitation to claim 13,

where the limitation specifies that the Layer-3 VPN service piggybacks VPN routes onto the backbone Border Gateway Protocol.

The Examiner indicates that Rosen discloses piggybacking VPN routes onto the backbone Border Gateway Protocol. While Rosen doesn't use the terms "piggybacking" and "backbone", the Applicant submits that claim 14 stands or falls with claims 12 and 13.

Based on indirect dependence upon claim 12, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 14, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 14.

Claim 15

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 13. Claim 15 is dependent upon claim 13 and claim 15 adds a limitation to claim 13, where the limitation specifies that the Layer-3 VPN service uses a virtual router redistribution scheme.

The Examiner indicates that Rosen discloses use of a virtual router redistribution scheme. While Rosen doesn't use the term "virtual router", the Applicant submits that claim 15 stands or falls with claims 12 and 13.

Based on indirect dependence upon claim 12, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose all of the elements of claim 15, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 15.

Claim 16

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 12. Claim 16 is dependent upon claim 12 and claim 16 adds a further limitation to claim 12, the further limitation being an element of distributing said mapping information to port information tables of said provider network via an auto-discovery mechanism.

The Examiner indicates that Ould-Brahim discloses an auto-discovery mechanism "for distributing said mapping information to port information tables of said provider network" and, in support, cites propagation of local information to other PE ONEs by using BGP with multi-protocol extensions. Accordingly, the Applicant submits that claim 16 stands or falls with claim 12.

Based on dependence upon claim 12, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 16, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 16.

Claim 17

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 16. Claim 17 is dependent upon claim 16 and claim 17 adds a further limitation to claim 17, the further limitation being that the auto-discovery mechanism for distributing the mapping information uses Border Gateway Protocol.

The Examiner indicates that Ould-Brahim discloses an auto-discovery mechanism "for distributing said mapping information to port information tables of said provider network" and, in support, cites propagation of local information to other PE ONEs by using BGP with multi-protocol extensions. Accordingly, the Applicant submits that claim 17 stands or falls with claim 16.

Based on indirect dependence upon claim 12, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 17, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 17.

Claim 18

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 12. Claim 18 is dependent upon claim 12 and claim 18 adds a further limitation to claim 12, the further limitation being an element of restricting element connectivity to

elements of said first subset via said provisioning mechanism operating in conjunction with said signalling mechanism.

The Examiner indicates that Ould-Brahim discloses the restriction claimed in claim 18, that is, a restriction of connectivity. However, the passage of Ould-Brahim cited by the Examiner relates to restriction of addition of routes to a port information table (PIT). The Applicant submits that the restriction of addition of routes to a PIT is distinct from operating in conjunction with a signalling mechanism to restrict element connectivity. Accordingly, the Applicant submits that claim 18 stands or falls alone.

Since neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 18, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 18.

Claim 19

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 12. Claim 19 is dependent upon claim 12 and claim 19 adds a further limitation to claim 12, the further limitation being that the signalling mechanism is an MPLS signalling mechanism.

The Examiner indicates that Ould-Brahim discloses an MPLS signalling

mechanism. Indeed, Ould-Brahim discloses using a GMPLS signalling mechanism to establish optical connections between client devices. As stated above, the Applicant submits that, in Ould-Brahim, the CE are using GMPLS to create layer-1/optical connections only. Accordingly, Ould-Brahim does not disclose use of MPLS in the manner in which the signalling mechanism is described in claim 12. Applicant submits that claim 19 stands or falls with claim 12.

Based on direct dependence upon claim 12, neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 19, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 19.

Claim 20

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 12. Claim 20 is dependent upon claim 12 and claim 20 adds a further limitation to claim 12, the further limitation being that the data and signalling services have IP signalling services.

The Examiner indicates that Rosen discloses IP signalling services. Accordingly, the Applicant submits that claim 20 stands or falls with claim 12.

Based on direct dependence upon claim 12, neither Ould-Brahim, nor a

combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 20, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 20.

Claim 21

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 12. Claim 21 is dependent upon claim 12 and claim 21 adds a further limitation to claim 12, the further limitation being that customer port addresses need be unique only within the first subset of elements.

The Examiner indicates that Ould-Brahim discloses that a PE ONE identifier need not be unique across several OVPNs. Accordingly, the Applicant submits that claim 21 stands or falls with claim 12.

Based on direct dependence upon claim 12, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim 21, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 21.

Claim 22

It has been submitted above that neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen, disclose or suggest all of the elements of claim

12. Claim 22 is dependent upon claim 12 and claim 22 adds a limitation to claim 12, where the limitation specifies that the customer port addresses and provider port addresses use an addressing scheme chosen from the group of IPv4, IPv6, and NSAP.

The Examiner indicates that Ould-Brahim discloses that a an IP address may be chosen as a port identifier. Accordingly, the Applicant submits that claim 22 stands or falls with claim 12.

Based on direct dependence upon claim 12, neither Ould-Brahim, nor a combination of Ould-Brahim and Rosen, disclose all of the elements of claim 22, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 22.

Claim 23

It appears that the Examiner's rationale for the rejection of claim 23 is that claim 23 combines prior art elements according to known methods to yield predictable results. The Applicant respectfully submits that the references cited by the Examiner fail to disclose or suggest all of the elements recited in claim 23.

Claim 23 describes a method of organizing a network. The method includes an element that requires that services connecting customer ports to provider ports "allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information".

In conjunction with the discussion of the rejection of claim 1 above, the Applicant has submitted that neither Ould-Brahim nor Rosen disclose Layer-3 peering between customer elements and provider elements. Since neither Ould-Brahim, nor Rosen, nor a combination of Ould-Brahim and Rosen disclose the Layer-3 peering between customer elements and provider elements, Applicant submits that the Examiner has erred in rejecting, as an obvious combination of Ould-Brahim and Rosen, claim 23.

Claim 24

The Examiner has rejected claim 24 under 35 U.S.C. § 102(b) as being anticipated by Ould-Brahim.

The Examiner indicates that the PEs in Ould-Brahim are "associated in a Layer-3 Virtual Private Network" as required by claim 24. The Applicant respectfully disagrees. The Examiner cites Page 6, paragraph 5 as support for the contention that Ould-Brahim discloses a Layer-3 VPN. However, the cited passage discusses the propagation of local information to other PE ONEs by using BGP with multi-protocol extensions. It is notable that the PE ONEs are associated in an Optical VPN, that is a Layer-1 VPN and not a Layer-3 VPN.

The Applicant submits that, since Ould-Brahim does not discloses PEs "associated in a Layer-3 Virtual Private Network", Ould-Brahim does not anticipate claim 24. Applicant further submits that the Examiner has erred in rejecting, as

anticipated by Ould-Brahim, claim 24.

Conclusion

In conclusion, the Examiner's rejections of claim 1-23 under 35 U.S.C. § 103(a) fail to establish a *prima facie* case of obviousness. The rejections are therefore improper and the Appellant respectfully requests that the Board reverse the Examiner's obviousness rejections of claims 1-23. Furthermore, the Examiner has failed to identify all of the elements of claim 24 in Ould-Brahim. The rejection of claim 24 as anticipated by Ould-Brahim is, accordingly, also improper and the Appellant respectfully requests that the Board reverse the Examiner's anticipation-based rejection of claim 24.

Respectfully Submitted,
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(viii) *Claims Appendix*

1. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs, said network comprising:

a set of elements interconnected by services;

at least one first subset of said elements defining a private network;

at least one second subset of elements different from said first subset defining a provider network wherein at least two subgroups of said first subset of elements may be connected via said provider network, said second subset of elements implementing a Layer-3 VPN service;

a provisioning mechanism used to define element membership in said first subset of elements;

a plurality of customer ports maintained on said elements of said first subset of elements;

a plurality of provider ports maintained on said second set of elements, each of said plurality of provider ports connected by services to a customer port, where said services allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information;

a port information table at each element of said provider network having a provider port among said plurality of provider ports, said port information table containing mapping information relating addresses of said customer ports to addresses of said provider ports for said first subset of elements;

a signalling mechanism used to create Layer-2 connectivity between elements within said first subset of elements at the Layer-2 level across said Layer-3 VPN service implemented by said second subset of elements; and

a reachability distribution mechanism;

such that a layer-2 VPN may be provided across said Layer-3 VPN service.

2. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, wherein said reachability distribution mechanism uses a Layer-3 VPN service.

3. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 2, wherein said a subset of Layer-3 VPN service piggybacks VPN routes onto the backbone Border Gateway Protocol.

4. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 2, wherein said a subset of Layer-3 VPN service uses a virtual router redistribution scheme.

5. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, wherein said signalling mechanism is an MPLS signalling mechanism.

6. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, further comprising an auto-discovery mechanism for distributing said mapping information to port information tables of said provider network.

7. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 6, wherein said auto-discovery mechanism for distributing said mapping information uses Border Gateway Protocol.

8. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, wherein said provisioning mechanism operates in conjunction with said signalling mechanism to restrict element connectivity to elements of said first subset.

9. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, wherein said data and signalling services have IP signalling services.

10. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, wherein said customer port addresses need be unique only within said first subset of elements.

11. (rejected, on appeal) A network for providing switched virtual circuit Layer-2.5 VPNs as claimed in claim 1, wherein said customer port addresses and provider port addresses use an addressing scheme chosen from the group of IPv4, IPv6, and NSAP.

12. (rejected, on appeal) A method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of said elements defines a private network and at least one second subset of elements different from said first subset defines a provider network implementing a Layer-3 VPN service and wherein at least two subgroups of said first subset of elements may be connected via said provider network, said method comprising:

defining element membership in said first subset of elements via a provisioning mechanism;

establishing a plurality of customer ports within said elements of said first subset of elements;

establishing a plurality of provider ports within said second set of elements, each of said plurality of provider ports connected by services to a customer port, where said services allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information;

establishing a port information table at each element of said provider network having a provider port among said plurality of provider ports, said port information table containing mapping information relating addresses of said customer ports to addresses of said provider ports;

determining reachability across said second subset of elements; and

creating Layer-2 connectivity within said first subset of elements at the Layer-2 level across said Layer-3 VPN service implemented by said second subset of elements via a signalling mechanism;

thereby allowing provision of a Layer-2 VPN across said Layer-3 VPN service while allowing provision of Layer-3 services.

13. (rejected, on appeal) The method of claim 12 wherein said reachability is determined via a Layer-3 VPN service.

14. (rejected, on appeal) The method of claim 13 wherein said Layer-3 VPN service piggybacks VPN routes onto the backbone Border Gateway Protocol.

15. (rejected, on appeal) The method of claim 13 wherein said Layer-3 VPN service uses a virtual router redistribution scheme.

16. (rejected, on appeal) The method of claim 12, further comprising distributing said mapping information to port information tables of said provider network via an auto-discovery mechanism.

17. (rejected, on appeal) The method of claim 16, wherein said auto-discovery mechanism for distributing said mapping information uses Border Gateway Protocol.

18. (rejected, on appeal) The method of claim 12 further comprising restricting element connectivity to elements of said first subset via said provisioning mechanism operating in conjunction with said signalling mechanism.

19. (rejected, on appeal) The method of claim 12 wherein said signalling mechanism is an MPLS signalling mechanism.

20. (rejected, on appeal) The method of claim 12 wherein said data and signalling services have IP signalling services.

21. (rejected, on appeal) The method of claim 12 wherein said customer port addresses need be unique only within said first subset of elements.

22. (rejected, on appeal) The method of claim 12 wherein said customer port addresses and provider port addresses use an addressing scheme chosen from the group of IPv4, IPv6, and NSAP.

23. (rejected, on appeal) A method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of said elements defines a private network and at least one second subset of elements different from said first subset defines a provider network and wherein at least two subgroups of said first subset of elements may be connected via said provider network, said method comprising:

defining a L2VPN topology;

establishing a plurality of customer ports within said elements of said first subset of elements;

establishing a plurality of provider ports within said second set of elements, each of said plurality of provider ports connected by data and signalling services to a customer port, where said data and signalling services allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information;

creating a Layer-2 Port Information Table for each provider port;

establishing the identity of said customer ports attached to each provider port among said plurality of provider ports, and populating the Layer-2 Port Information Table at said each provider port with mapping information relating addresses of said customer ports to addresses of said provider ports;

distributing said mapping information to Layer-2 Port Information Tables of said provider network via an auto-discovery mechanism;

determining reachability across said second subset of elements via a Layer-3 VPN service; and

creating Layer-2 connectivity within said first subset of elements at the Layer-2 level across said Layer-3 VPN service implemented by said second subset of elements via a signalling mechanism upon request from an element within said first subset of elements;

thereby allowing provision of a Layer-2 VPN across said Layer-3 VPN service while allowing provision of Layer-3 services.

24. (previously presented) A network for providing switched virtual circuit Layer-2.5 VPNs, said network comprising:

a plurality of customer edge devices associated in a Layer-2 Virtual Private Network;

a plurality of provider edge devices associated in a Layer-3 Virtual Private Network, where each provider edge device of said plurality of provider edge devices is configured to:

receive Layer-3 routing instructions from an attached customer edge device of said plurality of customer edge devices;

receive Layer-2 data frames from said attached customer edge device;

route said Layer-2 data frames through said Layer-3 Virtual Private Network according to said Layer-3 routing instructions.

(ix) *Evidence Appendix*

None.

(x) *Related Proceedings Appendix*

None.